

The following Listing of the Claims replaces all prior Listings of the Claims within this application.

LISTING OF THE CLAIMS

Claims 1 – 25 (Cancelled)

Claim 26 (Currently amended) A method of fabricating a ~~silicon-on-insulator (SOI)~~ substrate ~~having a uniform buried oxide layer, said method~~ comprising:

forming a porous ~~silicon-containing~~ Si-containing region having a porosity of about 0.01% or greater in an upper portion of a Si-containing substrate;

forming a single crystal Si-containing layer directly on top of said porous ~~[[silicon containing]]~~ Si-containing region by epitaxial deposition;

forming an oxygen implant region by implanting oxygen ~~atoms~~ ions into at least the porous Si-containing region said wafer, wherein ~~the~~ a peak oxygen content peak is provided by the implanting of the oxygen ions, and is located within said porous ~~silicon-containing~~ Si-containing region or at an interface between said single crystal Si-containing layer and said porous ~~silicon-containing~~ Si-containing region; and

annealing ~~said wafer~~ using a thermal oxidation process at a temperature at which said implanted oxygen precipitates as oxides, wherein said precipitated oxides combine to form a uniform buried oxide layer extending across an entirety of a semiconductor-on-insulator (SOI) ~~substrate wafer, wherein said porous silicon-containing region includes voids that are located beneath said uniform buried oxide layer after said annealing wherein after the annealing, portions of the porous Si-containing region located beneath said uniform buried oxide layer now contain voids, wherein a variation of thickness of said uniform buried oxide layer across said entirety of~~

said ~~SOI wafer~~ Si-containing substrate is less than 30% of a total thickness of said uniform buried oxide layer, and wherein a Si-containing over-layer is formed from a remaining portion of said single crystal Si-containing layer.

Claim 27 (Currently amended) The method of Claim 26, wherein some pores in said porous ~~silicon-containing~~ Si-containing region are consumed during said thermal oxidation process and other pores in said porous ~~silicon-containing~~ Si-containing region collapse into said voids beneath said uniform buried oxide layer during said annealing.

Claim 28 (Currently amended) The method of Claim 26, wherein said porous ~~silicon-containing~~ Si-containing region is formed by porous silicon electrolytic anodization of an exposed surface of said Si-containing substrate.

Claim 29 (Currently amended) The method of Claim 26, further comprising annealing said silicon-on-insulator (SOI) ~~substrate structure~~ in a hydrogen containing ambient after said thermal oxidation process, wherein a level of dopant atoms in said Si-containing over-layer is reduced during said annealing in said hydrogen containing ambient.

Claim 30 (Previously presented) The method of Claim 26, wherein an oxygen dose of about $1\text{E}17$ atoms/cm² or less is employed during said implanting of said oxygen atoms, and wherein said uniform buried oxide layer has a thickness of about 100 nm or less.

Claim 31 (Currently amended) A method of fabricating a ~~silicon-on-insulator (SOI)~~ substrate

~~having a plurality of uniform buried oxide regions, said method comprising:~~

forming a porous ~~silicon-containing~~ Si-containing region having a porosity of about 0.01% or greater in an upper portion of a Si-containing substrate;

forming a single crystal Si-containing layer directly on top of said porous ~~silicon-containing~~ Si-containing region by epitaxial deposition;

forming a plurality of patterned oxygen implant regions by implanting oxygen ~~atoms~~ ions into at least the porous Si-containing region ~~said wafer~~, wherein the a peak oxygen content peak ~~is provided by the implanting of the oxygen ions, and is~~ located within said porous ~~silicon-containing~~ Si-containing region or at an interface between said single crystal Si-containing layer and said porous ~~silicon-containing~~ Si-containing region; and

annealing ~~said wafer~~ using a thermal oxidation process at a temperature at which said implanted oxygen precipitates as oxides, wherein said precipitated oxides combine to form a plurality of ~~uniform~~ buried oxide islands, in which a variation in thickness of the buried oxide islands across an entire width of the buried oxide islands is less than 30% of a total thickness of the buried oxide islands, regions, wherein said porous silicon-containing region includes voids that are located beneath said uniform buried oxide layer after said annealing wherein after the annealing, portions of the porous Si-containing region located beneath said plurality of the buried oxide islands now contain voids, wherein a Si-containing over-layer is formed from a remaining portion of said single crystal Si-containing layer, and wherein said porous ~~silicon-containing~~ Si-containing region abuts said single crystal Si-containing layer around said plurality of ~~uniform~~ the buried oxide islands ~~regions~~.

Claim 32 (Currently amended) The method of Claim 31, wherein some pores in said porous

~~silicon-containing~~ Si-containing region are consumed during said thermal oxidation process, and other pores in said ~~silicon-containing~~ Si-containing region collapse into said voids beneath said plurality of uniform buried oxide regions during said annealing.

Claim 33 (Currently Amended) The method of Claim 31, wherein said porous ~~silicon-containing~~ Si-containing region is formed by porous silicon electrolytic anodization of an exposed surface of said Si-containing substrate.

Claim 34 (Previously presented) The method of Claim 33, further comprising annealing said silicon-on-insulator structure in a hydrogen containing ambient after said thermal oxidation process, wherein a level of dopant atoms in said Si-containing over-layer is reduced during said annealing in said hydrogen containing ambient.

Claim 35 (Previously presented) The method of Claim 33, wherein an oxygen dose of about $1\text{E}17$ atoms/cm² or less is employed during said implanting of said oxygen atoms, and wherein said uniform buried oxide layer has a thickness of about 100 nm or less.

Claim 36 (Currently amended) A method of fabricating a ~~silicon-on-insulator (SOI)~~ substrate ~~having voids beneath at least one uniform buried oxide region, said method comprising:~~

forming a porous ~~silicon-containing~~ Si-containing region having a porosity of about 0.01% or greater in an upper portion of a Si-containing substrate;

forming a single crystal Si-containing layer directly on top of said porous ~~silicon~~ containing Si-containing region by epitaxial deposition;

forming at least one oxygen implant region by implanting oxygen ~~atoms~~ ions into at least the porous Si-containing region said wafer, wherein ~~the~~ a peak oxygen content peak is provided by the implanting of the oxygen ions, and is within said porous ~~silicon-containing~~ Si-containing region or at an interface between said single crystal Si-containing layer and said porous ~~silicon-containing~~ Si-containing region; and

annealing ~~said wafer~~ using a thermal oxidation process at a temperature at which said implanted oxygen precipitates as oxides, wherein said precipitated oxides combine to form at ~~least one~~ a uniform buried oxide region during said annealing, wherein some pores in said porous ~~silicon-containing~~ Si-containing region collapse into voids beneath ~~said at least one~~ the uniform buried oxide regions during said annealing, ~~wherein said porous silicon-containing region includes voids that are located beneath said uniform buried oxide layer after said annealing~~ wherein after the annealing, portions of the porous Si-containing region located beneath said uniform buried oxide layer now contain voids, and wherein a Si-containing over-layer is formed from a remaining portion of said single crystal Si-containing layer to provide a semiconductor-on-insulator (SOI) substrate.

Claim 37 (Currently amended) The method of Claim 36, wherein pores in said porous ~~silicon-containing~~ Si-containing region are consumed during said thermal oxidation process.

Claim 38 (Cancelled).

Claim 39 (Cancelled).

Claim 40 (Currently amended) The method of Claim 36 ~~[[39]]~~, wherein said porous ~~silicon~~ Si-
containing ~~[[containing]]~~ region is formed by porous silicon electrolytic anodization of an
exposed surface of said Si-containing substrate.

Claim 41 (Currently amended) The method of Claim 36, further comprising annealing said
~~silicon-on-insulator structure~~ semiconductor-on-insulator (SOI) substrate in a hydrogen
containing ambient after said thermal oxidation process, wherein a level of dopant atoms in said
Si-containing over-layer is reduced during said annealing in said hydrogen containing ambient.

Claim 42 (Previously presented) The method of Claim 36, wherein an oxygen dose of about
 $1\text{E}17$ atoms/cm² or less is employed during said implanting of said oxygen atoms, and wherein
said uniform buried oxide layer has a thickness of about 100 nm or less.